BY ORDER OF THE SECRETARY OF THE AIR FORCE

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Safety

BIRD AIRCRAFT STRIKE HAZARD (BASH) MANAGEMENT TECHNIQUES

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This pamphlet provides guidance for implementing an effective bird aircraft strike hazard reduction program. This pamphlet provides additional information on BASH as specified in AFI 91-202. This pamphlet applies to all Air Force personnel, Air National Guard and US Air Force Reserve units and members (excluding Aero Clubs) who plan, support, or are engaged in flying operations.

Chapter 1

BASH REDUCTION PROGRAM

1.1. General Background:

1.1.1. Aircraft collisions with birds cause millions of dollars in aircraft damage and the loss of aircraft and aircrews. However, procedures to reduce these losses are available. Ways to reduce bird strike hazards can be divided into four categories:

- Awareness.
- Bird control
- Bird avoidance
- Aircraft design.

Bird strike hazards to aircrew and aircraft can be significantly reduced using a combination of the methods listed above. This may result in substantial savings of Air Force resources.

1.1.2. The (BASH) team was formed to coordinate effortsin all areas. The BASH team assists Air Force organizations worldwide to reduce damage caused by bird strikes and collisions with other animals, such as deer. The BASH team is located at Headquarters Air Force Safety Center (HQ AFSC/ SEFW; 9700 Avenue G SE, Bld 24499; Kirtland AFB, NM 87117-5671).

1.2. Basics for a Program.

1.2.1. The conditions that attract birds and the potential for bird strikes vary at each base. Birds may flock to airfields or cause hazards en route; hazards may be seasonal or year round. Bird activity may vary as local conditions change resulting from changes in crops, landfill operations, or land uses such as the creation of a wildlife refuge. Base-level personnel must be aware of bird attractants and proper bird control techniques. They should contact local agencies or the BASH team to help them solve bird problems. The BASH team or local agencies may be able to suggest proven methods for bird dispersal, bird avoidance procedures, and land management techniques that discourage birds from gathering.

1.2.2. The time and effort needed to maintain a safe airdrome depends upon the severity of the bird strike hazard and how well base personnel are prepared to reduce these hazards. The key to a successful BASH reduction program is participation by well-trained individuals assigned specific tasks. The possibility of bird strikes can never be eliminated; but, the potential for bird strikes and damage to Air Force property can be limited with an aggressive, well planned program developed on the basis of bird habits, the environment, and the base mission. Following are guidelines for BASH reduction programs.

1.3. Developing a Program.

1.3.1. Bird Hazard Reduction Plans. A well written, workable BASH plan is the key to reducing bird strike hazards and ensures continuity of knowledge with personnel turnover. If needed, a sample BASH plan may be obtained from MAJCOM Flight Safety offices. Tailor your plan to meet the specific hazards in your region. Integrate all habitat modification procedures making sure natural resource plans are compatible with base BASH program plans. As a minimum this plan should:

- Inform new personnel of local hazards.
- Cite local conditions that attract birds to the airfield and measures to reduce the attractiveness (for example, long grass, insect reduction, water drainage).
- Outline bird dispersal procedures and OPR.
- Define base bird watch condition codes, implementation procedures, authorization for declaring codes and flight operations under specified bird watch condition codes.

1.3.2. Bird Hazard Working Group (BHWG). The BHWG consists of representatives from flight safety, airfield management, base operations, air traffic control, civil engineering, aircraft maintenance and any other organization concerned with bird hazards. The group meets regularly to assist the safety office in drafting and implementing the Bird Hazard Reduction Plan. Meetings should be held IAW AFI 91-202.

1.3.3. Base Self-Inspection Checklist. A BASH self-inspection checklist is a useful tool in identifying deficiencies in BASH reduction plans. A sample checklist is provided as **Attachment 1**.

1.4. Documenting Bird Hazards:

1.4.1. Part of evaluating airfield bird hazards is learning about local bird activities, species that cause hazards, locations of local bird refuges, and daily bird surveys. When information is compiled over several seasons or years, development of a more effective bird hazard reduction program is possible. The bird surveys should include:

- Date and time.
- Weather conditions.
- Bird species.
- Bird locations on the airfield.
- Bird flying activity (soaring to and from roosts, feeding, etc.).
- Bird activities (loafing, feeding, drinking, etc.).
- Possible attractants.

NOTE:

If birds come to the field when it is mowed, record increases in insects on the airfield that attract birds, and determine whether crops harvested in the area attract birds to feed. Periodically, evaluate the information you gather to give a clear picture of the hazard.

1.4.2. Documenting the local bird problem and technical assistance received and recording the success of solutions tried are essential parts of any bird hazard reduction program. Complete documentation is necessary to acquaint new personnel with the problem and may be required in any civil litigation regarding bird hazards.

1.4.3. Photograph and summarize all hazardous situations that birds create on base. For example, pictures of gulls loafing on the airfield accompanied by observations that show the birds are using a nearby sanitary landfill can provide a strong case against future expansion of the landfill. Good documentation gives credence to the problem and shows that solutions are being considered.

Chapter 2

AIRFIELD HAZARD CONTROL METHODS

2.1. Introduction to Airfield Bird Control. Several active and passive techniques can be successful in reducing bird population levels. These techniques vary in cost and effectiveness depending on the situation. Active control involves causing birds to disperse from an airfield to give short-term relief from an immediate safety hazard. Passive techniques are more long term in nature. They involve managing the airdrome to eliminate those factors that attract birds to the airfield.

2.2. Active Controls. Birds on runways, taxiways or infields create an immediate safety hazard and must be dispersed before flying operations can safely continue. Birds move quickly and unpredictably. Even when left in a "safe" portion of the airfield, they can move and create an immediate hazard. They may also act as decoys that attract additional birds. No single method of bird dispersal works for all problems. Bioacoustics, depredation and other methods have been effective in dispersing birds from airfields.

NOTE:

The key to active bird dispersal is perseverance. When birds are strongly attracted to an airfield, several teams may be required to provide continual harassment. Usually, a single trip around the airfield will not remove all the birds.

2.2.1. Pyrotechnics. Pyrotechnics are noise producing devices, which are effective in bird dispersal. Scare cartridges, a commercially available pyrotechnic, fired from a 12-gauge shotgun or an NJ-8 Very pistol [with a locally manufactured steel sleeve insert (technical order (TO) 11W2-9-2-31)], are authorized. With these devices, an explosive charge is fired 50 to 100 meters. At this distance, it detonates producing a loud noise. Pyrotechnics can be used to flush and direct flocks of birds in a desired direction. For example, if a flock of gulls is feeding near an active runway, a scare cartridge exploded between the birds and the runway will usually cause the birds to fly away from the source of the noise and not pass over the runway. Close coordination with the control tower is essential so that birds are not directed into the path of arriving or departing aircraft. Always advise base security police before pyrotechnics are used. The base agency storing and using pyrotechnics must follow AFR 127-100 guidelines. Since harassment constitutes a "taking" for purposes of the Endangered Species Act, the US Fish and Wildlife Service (USFWS) must be consulted prior to the use of pyrotechnics if their use will affect any such endangered species.

2.2.2. Bioacoustics This dispersal technique uses broadcasts of recorded bird distress calls. Depending on the species, the calls may create differing responses; some will come to the calls while others may depart the area. For this reason, the sound source must be properly placed so that the birds fly away from the runway. Tapes of distress calls for many bird species are available from commercial suppliers. As with pyrotechnics, if the use of bioacoustics will have an impact upon an endangered species, the USFWS must be consulted prior to use.

2.2.2.1. Distress tapes are used with a vehicle equipped with a sound system producing 30 to 50 watts of distortion-free sound in 90 to 100 decibel (dB) with a frequency response between 12,000 and 14,000 Hertz (Hz). A speaker is mounted on the vehicle. The operator identifies the birds to be dispersed and selects the desired tape. The vehicle is driven as close as possible to the birds. Depending on physical factors such as terrain, trees, and structures on the airfield, the distance

from the problem birds will vary. Employ bioacoustics 100 to 200 meters as the maximum distance from birds to achieve the desired results. The distress call is then played for 15 to 20 seconds. If the birds have not moved within 20 seconds, play the call again. If they have not moved by the third attempt, other methods are required. Remember four important points when using bioacoustics:

- Try to identify the bird species you wish to disperse and use that species distress tape. However, a variety of tapes may be tried to determine what is effective for that particular type of pest bird. Some bird species do not respond to distress calls.
- Make sure the vehicle is stopped when the distress calls are played. Birds need to identify the source of the disturbance before they can react.
- Do not allow the distress calls to play indefinitely because birds can become accustomed (habituate) to them.
- The effectiveness of distress calls is dramatically increased when combined with other frightening techniques, especially pyrotechnics.

2.2.2.2. Distress calls have limited use in many situations. Not all birds are affected by bioacoustics. Birds often react to the calls by flying toward the source, circling it, and gradually moving away. This takes time and may create a momentary hazard. These birds can best be dispersed by combining bioacoustics with pyrotechnics. The distress tape is played to get the birds in the air, then pyrotechnics are used to disperse them. Hazards to flying operations can be alleviated by using these techniques before flying begins or during breaks in flight activities.

2.2.2.3. Gulls, starlings, blackbirds, and crows can be effectively dispersed with distress tapes. Occasionally, recorded distress calls of different bird species will frighten a variety of birds; however, nonspecific distress calls are the most effective.

2.2.3. Depredation. Bioacoustics and pyrotechnics provide good bird control in most situations. Yet birds sometimes become accustomed to these techniques, and a few individual birds may have to be killed to reinforce the idea that a significant danger exists. A federal depredation permit, available from the US Fish and Wildlife Service (USFWS), is required before killing any protected birds. Only European Starlings *(Sturnus vulgaris)*, House Sparrows *(Passer domesticus)*, and Rock Doves/domestic pigeons *(Columba livia)* are not federally protected in the United States and require no federal depredation permit. The permit specifies the species and numbers of birds that can be taken and the technique to be used. ***Note: Some states may require additional permits. These may be coordinated with the USFWS as well. Coordinate with the base environmental flight and legal offices when obtaining permits.***

2.2.4. Other Bird Control Methods. Other bird control methods listed below may be effective.

2.2.4.1. Propane Gas Cannons. These devices should be operated, especially at dawn and dusk, as birds come in to feed or roost. Cannons must be relocated frequently to avoid habituation problems. These devices are very effective when used in conjunction with other harassment techniques on waterfowl, pheasants, and other game birds and can also be used for gulls and blackbirds.

2.2.4.2. Falcons. Falcons trained for airfield bird dispersal may be effective when used in combination with other frightening techniques. But, there are limitations to falconry. Falcons can be flown only during daylight hours in good weather, they are difficult to obtain, train/maintain, and they cannot be flown when molting or after feeding.

2.2.4.3. Dogs. Use of Border Collie dogs to disperse geese has been effective under certain circumstances.

2.2.5. Ineffective Methods of Control:

- Stuffed owls and rubber snakes have been advertised to rid hangars and buildings of birds. They are usually a waste of money and effort.
- Rotating lights have brought conflicting results; but, are generally considered ineffective. Birds quickly habituate to these devices, and the problem remains unsolved.
- Eye spots on aircraft components is being studied in the United States and other countries. Early results suggest the addition of eye spots does not significantly reduce the BASH potential.
- Ultra-sonic devices.

2.2.6. Personnel and Equipment. Each installation with a BASH program should designate and train personnel for bird dispersal regardless of the severity of airfield birdstrike problems. In many instances, the presence of hazardous birds is a transient condition and may only require active bird dispersal for short periods throughout the year. Bird dispersal equipment should be located in the same area as the personnel tasked for bird dispersal so that it is readily available when bird hazards arise. Installations subject to deployment should include bird dispersal equipment for such contingencies. Each installation should designate individuals responsible for bird dispersal during deployments and properly train these personnel.

2.3. Passive Controls. The most permanent methods of discouraging birds from using airfields involve removing attractive habitat features. Methods to reduce bird attractants include:

2.3.1. Grass Management. As a minimum, address the following factors:

2.3.1.1. Grass Height. Mow airfield grass IAW AFI 91-202. Coordinate mowing with periods of low flight activity. Cut grass before it goes to seed to discourage seed eating birds from using the airfield. Grass between 7-14 inches discourages flocking species from entering the airfield because reduced visibility disrupts inter-flock communication and flock integrity and also prevents predator detection. Grass exceeding 14 inches (36 cm) will attract some bird species and rodents, which in turn attract raptors. Airfields with a variety of grass species should be mowed when the average grass height exceeds tolerances. Begin mowing adjacent to runways and finish in the infield or outer most grass areas. This causes insects and other animals to move away from aircraft takeoff and landing areas. Also, do not mow grass shorter next to the runway than in other areas.

2.3.1.2. Herbicides and Growth Retardants. Keep broad-leaved weeds to a minimum on the airfield. Apply herbicides as necessary to control weeds and comply with AFI 32-1053 and AFM 91-19 requirements. Broad-leaved weeds attract a variety of birds, may produce seeds or berries, and may limit grass growth. Growth retardants should be tested on small test plots before use on areas in general.

2.3.1.3. Planting Bare Areas. Reduce bare areas as birds frequently use them as resting sites on the airfield. Plant grass adapted to the area and irrigate only until new grass is established.

2.3.1.4. Fertilizing. Fertilize as needed to stimulate grasses and promote a uniform cover. Rate and frequency of application may vary from that of other semi-improved grass areas and should be based on soil test results.

2.3.1.5. In geographic locations where conditions do not support turf growth, such as in desert environments, it may be advisable to allow vegetation to remain in a natural state as disturbance may provide exotic conditions attractive to some forms of wildlife.

2.3.2. Managing Reforested Areas. Site commercial forest areas so as not to contribute to the installation BASH problem. The types of trees planted for forest production are often different than those in the surrounding community and may serve as bird roosting sites. For example, the dense canopy of a planted pine forest in a hardwood region may provide ideal roosting sites. When this happens, roosting can usually be discouraged by thinning the roosting areas (removing certain trees to produce an open stand canopy). If necessary, remove all trees from the site and grass and maintain the area with other airfield turf areas. Should a stand of trees contain birds protected by the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act or any other species protected by the Endangered Species Act, the USFWS should be contacted to determine whether an incidental taking permit is required prior to any tree removal. Federal law clearly indicates that the destruction of wildlife habitat can be tantamount to a taking of protected species and, in some instances, may not be allowed.

2.3.3. Landscaping. Shrubs, ornamental trees, shelterbelts, hedgerows, and noise suppression barriers are important plantings on a base. However, the airfield and clear zones are not proper places for landscape plantings. These types of vegetation can influence bird populations and their movements around the base. Trees often intermingle as they mature, forming a continuous canopy. This close, dense foliage attracts birds and is ideal for providing shelter, food and nesting. Proper planning can reduce these potential bird attractants. When planting shrubs, select those species that do not produce fruit, especially during the winter. Ripe berries attract birds for short periods each year. Blackbird and starling roosts are particularly hazardous because of the large number of birds (often numbering in the millions) that may be present in a single roost. Birds can usually be stimulated to move by pruning and thinning trees and shrubs to open the canopy. In some situations, it may be necessary to remove all the plants. Trees and shrubs should not be allowed to grow in the infield areas.

2.3.4. Removal of Edge Effects. The greatest number of bird species are found where vegetation types change from forests to brush or brush to grass (edge effects). To reduce bird problems, keep edge effects to a minimum, or as far from the active runway as possible. If an airfield has clumps of brush and shrubs around the grass, more bird habitat is available. Remove brush and weeds to maintain the airfield in the most uniform condition possible. This eliminates the cover many birds and rodents require. Single trees or snags on an airfield may provide perches for hawks, owls or other bird species. Biodiversity practices should not be implemented on airfields.

2.3.5. Controlling Drainage. Fresh water is one of the most important airfield bird attractants, especially in arid regions and near the sea coast. Standing water creates a breeding place for insects, amphibians and other food sources for birds. After heavy rains, mark airfield areas with chronic standing water. Coordinate with CE or EM to fill, level, and re-seed these areas with grass to match the rest of the airfield. Since wetlands are strictly controlled by federal and state laws, coordination with CE or EM is a must before making any modifications to airfield drainage. Make airfield drainage ditches as deep as possible to limit the surface area of the water and still allow proper drainage according to civil engineering requirements. Wading birds, such as herons and shorebirds, are less likely to use

deep drainage ditches. Grade the banks of the drainage ditches to allow mowing up to the edge of the ditch. Keep drain pipes, culverts, and screens clear of debris so drainage is not impeded.

2.3.6. Locating Sewage Lagoons. Waterfowl and shorebirds are often attracted to sewage holding ponds. Birds use the water for resting and sometimes as a food source. Sewage lagoons are most attractive in arid climates. Ponds designed with steep sides and little surface area reduce the attraction to birds. Locate ponds as far from the runway as possible and place them so birds moving from off-base areas to the ponds do not cross runways.

2.3.7. Managing Sanitary Landfills:

2.3.7.1. On base Landfills. Landfills are the most significant attractant to hazardous bird species. Operate disposal sites according to FAA guidelines and state and federal laws. Relocate landfills that do not meet FAA guidelines criteria. If landfill relocation is not feasible, make the site as unattractive to birds as possible. Consider the following methods:

- Maintain a small working face to minimize exposed wastes.
- Incinerate waste.
- Operate the landfill as a pit or trench to limit access to birds.
- Dump waste at night or during non-flying periods.
- Cover waste material immediately.
- Discourage gulls and other birds with overhead wire barriers.
- Relocate putrescible wastes to a more remote landfill.
- Use bioacoustics and pyrotechnics to frighten birds away.

2.3.7.2. Off-base Landfills. The Air Force cannot control land use off-base; however, before landfills can be opened, the operator must obtain a state permit. A hearing is held about the potential environmental impact. Air Force concerns about potential bird hazards should be expertly presented at these hearings. Environmental planning, flight safety, public affairs, and the Judge Advocate should work jointly to present Air Force interests. HQ AFSC/SEFW will assist as needed.

2.3.8. Managing Agricultural Outleases. Many bases have agricultural programs on their airfields to reduce maintenance costs. These range from crop and hay outleases to grazing and reforestation. The types of crops grown and the agricultural methods used have important effects on local bird populations.

2.3.8.1. Grain crops within 1,000 feet of the runways are not recommended because harvest methods expose a ready food supply. Hay, cotton, and flax are the least attractive crops. Airfield crops should not be radically different from crops found in the surrounding community. Anything that makes the airfield unique can attract birds. Cultivation may attract birds by exposing large numbers of insects and earthworms.

2.3.8.2. Harvesting and planting schedules can also affect the numbers of birds the airfield attracts. For example, if an airfield hay crop is harvested before or after other hay crops in the region, large numbers of invertebrates may be exposed on the airfield that are not exposed in other fields. This might provide a more intense bird attractant than would usually exist.

2.3.8.3. Agricultural activities should also consider the local flying schedule. Planting, cultivating, harvesting, or burning may temporarily increase airfield bird attractants, therefore should be done on weekends or other periods of reduced flying. Both airfield management and civil engineering personnel (AFI 32-7064) should closely monitor agricultural practices.

2.3.8.4. Grazing animals can be a serious hazard. Ensure strict animal control and proper fencing.

2.4. Flight Operation Considerations.

2.4.1. When environmental modifications and active control measures do not satisfactorily reduce bird hazards on the airfield, flying operations may have to be modified to reduce the risk of bird strikes. Bird Watch Condition Codes (see **Attachment 1**) may be a valuable tool for supervisors to make operational changes. These operational changes are dictated by the severity of the problem, the performance capability of the aircraft, training or readiness requirements. Bird hazards, like any other safety hazards, must be assessed with respect to operational requirements. During contingency operations or advanced stages of readiness, bird hazards have minimal safety priority. During training to maintain operational readiness, however, certain changes can be made to improve safety, reduce costly repairs and protect aircrews.

2.4.2. A knowledge of unit operational and training requirements, combined with an understanding of local flying restrictions, is necessary to properly evaluate possible modifications to local procedures.

2.4.3. The BHWG forms the nucleus for developing a bird avoidance program. The following recommendations can help reduce bird hazards by modifying operational procedures. The key to reducing bird strikes by changing flight operations is to avoid known locations, concentrations or movements of birds.

2.4.3.1. Takeoff. Aircraft making formation departures increase the risk of damaging bird strikes when birds are feeding or loafing on or near the runway. Formation and single-ship interval takeoffs often result in birds being scared up by the lead aircraft, causing the wingman to hit the birds. If large flocks of birds are scared up by the lead aircraft, the wingman may want to delay departure until the birds are clear of the runway. Pilots of lead aircraft must be alert to warn the wingman of bird hazards during takeoff. This is especially important as the wingman's attention is focused on the lead aircraft.

2.4.3.2. Migratory Bird Problems. When flocks of migratory birds are a problem, formation takeoffs and single-ship interval takeoffs with minimum spacing involving rejoins, increase the risk of serious bird strikes. All rejoins require greater attention by pilots to the lead aircraft's position. The increased speed required to catch the lead aircraft after takeoff increases the risk of damaging bird strikes. When birds are known to be flying in the area, departures under visual meteorological conditions (VMC) may be modified to reduce the risks. Departures should be made in trail, with the rejoin beginning after the aircraft passes 2,000 to 3,000 feet above around level (AGL). If aircraft are to enter a low-level route immediately or stay at an intermediate altitude for a prolonged period, tactical formation provides enough aircraft clearance to allow wingmen to stay clear of birds. When weather is a factor, single-ship takeoffs with an increased time interval between aircraft, approaches, and landings are preferred, since many bird strikes occur when aircraft are just under or immediately a low overcast sky condition.

2.4.3.3. Enroute Bird Strikes. Aircrews experiencing enroute bird strikes should abort the mission when possible. While an engine ingestion or a wind screen strike may readily be apparent from the

flight deck, the damage from many fuselage, wing, tail, or radome strikes cannot be adequately assessed. Continuing a mission may cause greater structural damage and a serious in-flight emergency situation later.

2.4.3.4. Low-Level Bird Strikes, Low-Level Routes. When flying low-level routes, higher aircraft speeds and greater exposure within the bird flight environment have led to many damaging bird strikes. Many of these strikes occur on low-level routes, airdrops, and bombing runs. During these flights, aircrew are involved in cockpit duties, which allow them little time to monitor bird activity. "Heads-up" flying should be stressed during these critical transitions. **Attachment 2**, "Low-Level Flight Considerations," provides general guidance for bird avoidance at low level.

2.4.3.5. Low-Level Bird Avoidance Model (BAM). The BAM is a computer model designed to predict the relative bird strike risk for flying along military low-level routes. The model is developed based on waterfowl and raptor (birds of prey) population data. It provides information in a graphic format. The graphs display the risk for flying these routes during day, dawn/dusk and night time periods on the same graph. By comparing graphs of different routes during specific time periods, the safest route to fly can be determined. See **Attachment 2** for additional guidelines.

2.4.3.5.1. Published Routes. Submit requests for graphs to HQ AFSC/SEFW, using the low-level route number.

2.4.3.5.2. Military Operating Areas (MOA), Ranges, Low Altitude Training (LATN) areas and Proposed Routes. Submit coordinates and AGL level of area to HQ AFSC/SEFW for evaluation.

2.4.3.6. Aircrew Preparations.

2.4.3.6.1. Briefings on bird strikes are much like briefings on takeoff emergencies when urgency dictates a pre-planned course of action. As a minimum, aircrew briefings should include the following:

- Potential bird problems along their proposed route of flight.
- Use of the double helmet visors or sunglasses during daylight hours, the clear visor at night or during low-level operations.
- Avoidance maneuvers at low altitude.
- Actions if flocks of birds are encountered (for example, initiate a climb since the majority of birds dive to avoid a potential collision).
- Mission abort due to birdstrike.

2.4.3.6.2. The aircrew's ability to react to a bird strike situation is further enhanced by periodically reviewing bird strike procedures during continuation training and safety briefings.

2.4.3.7. Informing Transient Aircrews of Local Bird Hazards. Transient aircrews are often unfamiliar with airfield hazards, including birds. At some bases, the most damaging bird strike incidents happen to transient aircraft. Information in the Flight Information Publications (IFR-Enroute Supplement, VFR-Enroute Supplement, and Area Planning/1B), and broadcasts of information on either Automatic Terminal Information Service (ATIS) or on initial radio contact can alert the aircrew of potential bird hazards. Advisory reports can inform aircrews of the timing and location of transient birds.

2.4.3.8. Aircrew Responsibility. Aircrews are essential to detecting birds on the airfield and in the local flying vicinity. When aircrews sight birds, they should notify other aircrews and the controlling agency. Aircrews may also help Air Traffic Control (ATC) personnel remain aware of bird hazards by requesting bird hazard information before takeoff and landing. These requests remind air traffic controllers to inspect for birds before authorizing movement.

2.4.3.9. Bird Hazard Identification. Bird populations, both in the local area and in regions where low-level sorties are flown, should be monitored. Aircrews must be aware of the potential bird hazards they may face. Information on bird concentrations and movements can be obtained from local universities, state and federal wildlife agencies, and private organizations such as the National Audubon Society.

2.4.3.10. BIRDWATCH. The term BIRDWATCH is used to help inform aircrews of operational changes required because of bird activities in local areas. Similar to a METWATCH for severe weather, BIRDWATCH alerts aircrews to possible flight hazards from increased bird activity. BIRDWATCH conditions should reflect varying degrees of bird hazards. Personnel authorized to declare BIRDWATCH conditions should be identified by the unit BASH plan. Encourage aircrews flying in the local area to use BIRDWATCH terminology to inform other aircrews about bird hazards in the traffic pattern. A BIRDWATCH alert broadcast over ATlS is important in informing transient aircrews of local conditions.

2.5. Technical Assistance. Up to date information on bird control and hazard reduction methods is available from several sources.

2.5.1. BASH Team. The BASH team assists in bird hazard reduction Air Force-wide. BASH team personnel are trained in bird control and have experience in wildlife ecology, land management and flight operations. They also have current information on authorized bird control equipment and techniques.

2.5.2. Air Force Civil Engineer Support Agency (AFCESA), Tyndall AFB, FL. The BASH Team works closely with AFCESA personnel both to control birds that are pests in structures and for vegetation control requiring agronomy or entomology expertise.

2.5.3. Federal and State Agencies. Often, bases employ professional foresters or agronomists who have valuable insights into base problems. Local expertise and assistance is available through the USDA Animal Damage Control, U.S. Fish and Wildlife Service, or State Natural Resources Department. **Attachment 4** contains a listing of agencies that can assist your BASH efforts.

Chapter 3

AIRFIELD WILDLIFE HAZARDS

3.1. Overview of Airfield Wildlife Hazards. Although it would be impossible to site every example of wildlife that is a potential airfield hazard the following are brief descriptions of general types of wildlife found on or around airfields and management techniques which are effective on each. It is very important to know which species is present before management techniques are applied. An appropriate field guide should be used to aid in identification. ***Note: The management techniques suggested below may require coordination with state and Federal authorities. For instance, filling in a swamp or wetland may require a state or Federal Clean Water Act section 404 permit. Similarly, action affecting flood planins or wetlands may also require the approval of SAF/MIQ. the direct or indirect taking of protected birds may require state or Federal permits or may not be permitted under any circumstances. Moreover, actions which result in the destruction of protected wildlife habitat, or even certain harassment techniques, may similarly be absolutely prohibited. In all cases, if an endangered species or a protected species may be present, base authorities should consult with the USFWS and obtain any necessary permits before taking any actions to control wildlife hazards. Consult the base environmental flight to ensure compliance with state and Federal statutes and regulations.***

3.2. Loons; Grebes, Pelicans, Cormorants, Mergansers. These are fish-eating birds. Control is best accomplished by removing fish-producing ponds near the airfield. Since removal of the food source is not always possible, pyrotechnics are effective in frightening birds from the area. Avoid flying at sunrise and sunset when large flocks, often in formation, can be found flying to and from feeding areas.

3.3. Pelagic Birds (Albatross, Petrels, Shearwaters, Auks, etc.). Control of these birds is nearly impossible since natural predators are rare and the birds exhibit little fear of man or aircraft. Avoid flying near nesting areas during the brief summer nesting period. These huge nesting colonies are located on steep, rocky coastlines or on islands where many thousands of birds may be concentrated.

3.4. Long-Legged Waders (Herons, Egrets, Ibises, Storks). Most of these species are attracted to water where they feed on fish, amphibians, reptiles, and arthropods. Control is best accomplished by eliminating the food sources. Steepening the sides of ditches and ponds and removing emergent vegetation will drastically reduce accessibility to food sources. Use pyrotechnics to disperse any birds that do occur after habitat modification.

3.5. Cattle Egrets. These birds have different feeding habits than their relatives, preferring open fields where they primarily feed on insects. They frequently follow mowers for the insects which are stirred up. Mow during non-flying hours when Cattle Egrets are present. Maintain grass between 7 to 14 inches. Periodic pesticide application may be necessary for insect control. Eliminate roost sites on or near base be removing or thinning roost trees and brush and dispersing the birds each evening with pyrotechnics.

3.6. Waterfowl (Ducks, Geese, Swans). A distinction must be made between resident and migrating populations.

3.6.1. Resident waterfowl are attracted to an area to breed or feed. Ponds, lakes, ditches, etc., may attract these birds, particularly if these areas contain emergent or submerged vegetation for feeding, nesting, or shelter. Steepening ditch and pond banks and removing vegetation will reduce waterfowl

numbers. When possible, drain water sources after ensuring compliance with wetlands laws and regulations. Grain fields may also attract waterfowl in large numbers and should be eliminated. Pyrotechnics along with gas cannons are control techniques. Use live ammunition or opening base areas to waterfowl hunting are excellent methods of control. Resident birds are most active at dawn and dusk, moving at low altitudes to and from feeding areas. Avoid flying near wildlife refuges or any ponds, lakes, or rivers with known waterfowl concentrations during these times.

3.6.2. Migrating waterfowl are particularly dangerous to flight safety due to the large numbers and generally higher altitude of the birds. Large flocks of waterfowl travel along traditional flyways to their breeding and wintering grounds during spring and fall. Huge flocks may stop along the route awaiting favorable weather conditions to continue. Migrating birds are most active from sunset through midnight, with numbers decreasing in the early morning hours. October and November are most hazardous. Avoid flying during the evening hours if possible. Obtain bird avoidance model (BAM) data from the BASH team for information and planning purposes for comparing low -level routes. Wintering concentration areas should be avoided.

3.7. Raptors (Hawks, Falcons, Kites, Eagles, Vultures). These birds can be particularly hazardous to aircraft because of their size and widespread distribution over bases and low-level areas. Raptors (particularly vultures) use thermals to their advantage to search for prey. These birds become active during mid morning and remain aloft until late afternoon. Avoid areas with thermal generating terrain such as ridge lines, rolling hills, and near water. Landfills are particularly attractive to soaring vultures. In the fall, raptors migrate by day to areas of heavy winter concentrations in the southern states and through Central America. These birds can be controlled by removing dead animals on the airfield, proper management of landfills, rodent control on airfields, and removal of dead trees and other perching sites on the airfield. Use pyrotechnics to frighten raptors from the airfield.

3.8. Grouse, Quail, and Pheasants. These game birds are most effectively controlled through proper grass-height management. Do not allow grass to exceed 14 inches and eliminate all brush and weed patches on the field, particularly if the plants are seed-producing. Pyrotechnics, gas cannons, live ammunition or periodic hunts can effectively disperse these birds. The killing of these birds outside the normal hunting season requires special permits from the US Fish and Wildlife Service and state wildlife agencies.

3.9. Cranes. These large birds are most hazardous during migrating periods, particularly in the fall when many thousands of birds may be concentrated in a small area. Avoid flying at dawn and dusk in areas of known concentrations. Use pyrotechnics on the airfield to disperse these birds.

3.10. Sandpipers and Shorebirds. The most significant hazard from these birds occurs when large numbers, flocking in tight groups, are present, particularly during migration and along coastlines. Many of the upland species such as Upland Sandpipers and Buff-Breasted Sandpipers may nest on airfields in spring and early summer. Other species such a Killdeer are quite adept at avoiding aircraft and do not pose a significant hazard. Flocks in coastal areas can be hazardous and should be avoided. To control these birds, observe proper grass height management. Eliminate water in puddles and steepen ditch banks to limit access to these birds. Use pyrotechnics for all species, and some respond well to bioacoustics.

3.11. Gulls. These birds represent the most significant hazard to aircraft worldwide. Due to their omnivorous feeding habits and preference for flat, open areas to rest, they are commonly found on airfields. Gulls are most active just after sunrise and before sunset as they move to and from feeding areas. Improp-

erly operated landfills are a significant source of attraction for gulls and should not be allowed in the airfield vicinity. Maintain grass height between 7 and 14 inches. This is critical in reducing gull numbers. Even with this in effect, gulls may inhabit the airfield, particularly during inclement weather. Persistent harassment using pyrotechnics and bioacoustics is necessary to discourage these birds. Occasionally, use live ammunition to reinforce these techniques (permits required). Control of earthworms and insects (especially grasshoppers) may be accomplished if these invertebrates are found to attract gulls. Do not allow these birds to establish a habit of using the airfield to feed, breed or rest.

3.12. Terns. These are fish-eating, gull-like birds common in coastal areas and on some major river systems and lakes. Avoid flying near areas where these birds may be active, such as nesting colonies or piers in coastal areas. Remove the food source or eliminate the fish-containing ponds if these birds pose a significant hazard.

3.13. Pigeons and Doves. These birds are seed eaters and are attracted to seed-producing weeds, grasses, and shrubs. Open areas or bare spots are attractive as resting or feeding sites. Pyrotechnics can be effective in frightening these birds. Proper grass-height management, irrigation, and mowing before grass goes to seed will limit the number of pigeons and doves on the field. Pigeons frequently occur in structures such as hangars. Netting, shooting, trapping, and poison baiting can drastically reduce their numbers in these structures.

3.14. Owls. Most owls are nocturnal and attracted to rodents as a food source. Rodent control may be necessary on the airfield; proper management of airfield grass will limit their numbers. Remove perch sites such as unnecessary fence posts and dead trees to limit the number of owls. Avoid over-flying landfills at night to reduce hazards from owls.

3.15. Goatsuckers (Nighthawks, Whip-poor-wills, etc.). These birds are active, particularly at sunset when insects are abundant. Little can be done to limit their numbers other than insect control. Avoid flying at times when these birds are abundant, particularly near lakes, streams, or other areas with large insect populations.

3.16. Woodpeckers. Woodpecker strikes should be extremely rare. These birds are common in forested areas, but generally remain below canopy level. On the airfield, elimination of trees should eliminate strikes with these birds. Migratory birds may be encountered, but are rarely struck.

3.17. Flycatchers. These birds are present on airfields to feed on insects. Strikes are infrequent, but should not be overlooked. Control is best accomplished by controlling insects and removing perch sites such as fence posts, tree limbs, bushes, high spots on the field, etc.

3.18. Horned Larks. These birds are very difficult to control. They are attracted by bare spots such as along runway sides where they eat weed seeds and insects. The best defense against these birds is a thick, uniform grass with no bare spots. In the southwest, this may not be possible as grass cannot be maintained. Consider coating bare spots, particularly along runways, with oil-base or asphalt cover. Use pyrotechnics, but these birds will tend to fly only short distances and settle down. Persistence is the key to success.

3.19. Swallows and Pratincoles. These birds eat insects in flight and are commonly found above airfields. Fortunately, swallows are adept at avoiding aircraft, but if they do present a problem, measures can be taken for their dispersal. Insect control will reduce swallow numbers and discouragement of nesting will further decrease numbers. Wash mud nests from eaves, culverts, etc., with a hose as the birds begin nesting. Nesting in banks can be discouraged by harassing the birds as they work on building. If swallows are noted resting on runways or taxiways, use pyrotechnics to disperse them.

3.20. Crows and Ravens. These omnivorous birds are common in open areas and around landfills. These birds may occur in large flocks, particularly at sunset as they return to roost sites. Proper grass-height management will reduce population numbers. Remove any known roost sites or thin individual trees. Operate landfills in a manner to discourage these birds. Use bioacoustics and pyrotechnics to frighten these birds if they occur on the field.

3.21. Blackbirds, Grackles, Cowbirds and Starlings. These birds can be particularly hazardous because they frequently occur in huge flocks, sometimes in the millions. Blackbirds and starlings are attracted to flat, open areas to feed, rest, or stage/pre-roost. Maintain grass height between 7 and 14 inches to best reduce airfield blackbird and starling numbers. Do not allow seed-producing plants to grow on the airfield nor outlease grain crops in areas where these birds are known to occur. Eliminate roost sites near the flight line. Selectively prune or remove roost trees, brush, or cat-tails if blackbirds and starlings are roosting on base. Blackbirds and starlings respond well to an intense frightening program using bioacoustics and pyrotechnics. Use other methods to supplement this program as necessary. Starlings are not federally protected and may be killed without permits. Permits are required for other species. Occasional shooting of birds will reinforce other frightening techniques. Consider poisoning or trapping, with US Fish and Wildlife Service assistance. Avoid at all costs flying near known blackbird and starling roosts, especially at sunrise and sunset and during spring and fall migration. Huge roosting colonies may also be present during winter months in southern states.

3.22. Meadowlarks. These birds occur on nearly every airfield and are attracted to grasslands and low weeds. Eliminate broad-leaf weeds and maintain grass height at 7 to 14 inches. Elimination of suitable perching sites, such as fence posts and brush, will also aid in reduction. Use pyrotechnics, but remember meadowlarks usually fly only a short distance before settling down again. Persistence is the key to success.

3.23. House Sparrows. These birds are not frequently struck by aircraft, but are common pests around structures. House Sparrows often nest in hangars and dense shrubs and trees. These birds are not protected by law and may be killed without permits. Frightening techniques are usually ineffective against these birds.

3.24. Warblers. The wide range of species of warblers thrive in a variety of habitats. Most prefer shrubs, trees, or riparian habitats where they feed, breed, or rest. Do not allow these habitat types on the airfield and warbler strikes will be rare as a result. Migrating warblers may be struck at night, especially as they fly south in fall. Fortunately, these birds are very small and rarely cause damage.

3.25. Fringillids (Sparrows, Finches, Grosbeaks, and Buntings). Most Fringillids are not hazardous to aircraft operations, but occasional large flocks can be encountered, particularly during migration. These birds are seed eaters as a rule, and most prefer weedy, brushy, or forested areas. Proper grass

height management is the best means of control. Grass exceeding 14 inches will attract many of these birds and should not be allowed. Mow before grass goes to seed. Use pyrotechnics to frighten many of these birds; success may be limited with others.

3.26. Other Wildlife. While concern is mostly centered on birds, several mammalian species also pose threats to flight operations and must be considered. Close coordination with the Integrated Natural Resources Management Plan is necessary to reduce this type of hazard.

3.26.1. Deer. Members of the deer family (including moose, elk and caribou) occasionally occur on airfields. These species are generally browsers, preferring broad-leaf weeds, shrubs and trees. Do not allow growth of these plants on the airfield. The presence of these plants in surrounding areas will serve to draw these animals from the airfield. Tall fences (up to 15 feet) can discourage these animals from entering airfields, but due to expense, should only be used in urgent cases. On-base hunting will also discourage the presence of deer species. Use pyrotechnics to frighten these animals when they do occur on the airfield.

3.26.2. Coyotes and Foxes. These animals are attracted to airfields by rodents, rabbits and other food sources. Dens may be found in banks, culverts or other suitable areas. Rodent control will reduce the numbers of these animals. Use pyrotechnics to frighten these species. Occasional shooting of individual animals or recurrent pests will also reduce the hazard. Coordinate with base natural resources personnel on permit requirements.

3.26.3. Rabbits and Hares. In addition to direct hazards to aircraft, these animals often attract raptors. Proper grass management will reduce the numbers of these animals on airfields. Occasional extensive rabbit hunts on the field can reduce populations for several subsequent years. Poisoning can also be effective for reduction of populations. Permits may be required.

3.26.4. Rodents. These animals attract raptors. Control by maintaining a uniform turf at the proper heights. Rodenticides may be used by the base civil engineer pest manager in some cases.

ORIN L. GODSEY, Brig Gen, USAF
Chief of Safety

Attachment 1

GLOSSARY OF TERMS

Terms

Aircraft Design— Engineering improvements that reduce aircraft damage when a bird strike occurs (for example, improved windscreen design).

Bird Avoidance— Techniques (including radar detection, warning, and use of bird data) that reduce potential for bird strikes by allowing aircrews to schedule or maneuver to avoid bird concentrations.

Bird Control—Any biological, chemical, or physical procedure that discourages the presence of birds. These procedures include repellents, toxicants, harassment, grounds maintenance, and habitat modification.

Bird Data—Information about the ecology, anatomy, physiology, behavior, size, movement, and distribution of birds that may be helpful in bird control, bird avoidance, and aircraft design.

Bird Hazard Reduction Plan—A written document that addresses bird strike hazards and designates organizations responsible for implementing solutions.

Bird Hazard Warning System—A set of procedures, using standard bird watch condition codes, for immediate exchange of information between ground and airborne personnel concerning the existence and location of birds posing a hazard to flight.

Bird Species—A group of interbreeding birds with common characteristics such as size, shape, voice, and behavior.

Bird/Wildlife Strike—Any collision between a bird/other wildlife and an aircraft.

Bird Watch Condition Codes—The following terminology is established for rapid communication of bird activity. When communicating, avoid color coded conditions to eliminate any confusion with color codes used during exercises, contingencies, and emergencies (i.e., disaster preparedness exercises). Also, give bird locations with the condition code:

- Bird Watch Condition SEVERE. High bird population on or immediately above the active runway or other specific location that represents a high potential for strike. Supervisors and aircrews must thoroughly evaluate mission need before conducting operations in areas under condition SEVERE.
- Bird Watch Condition MODERATE. Increased bird population in locations which represents an increased potential for strike. This condition requires increased vigilance by all agencies and supervisors and caution by aircrews.
- Bird Watch Condition LOW. Normal bird activity on and above the airfield with a low probability of hazard.

Damaging Bird/Wildlife Strike—Any bird/wildlife strike that causes reportable damage according to AFI 91-204.

Habitat—The total environmental elements of food, water, shelter, nesting sites, and space that must be present for wildlife species to survive.

Non-damaging Bird/Wildlife Strike—Any bird/wildlife strike that does not damage the aircraft or

cause damage to the aircraft IAW AFI 91-204.

Endandered Species Act, 16 U.S.C. 1531—Federal environmental statute which makes it a felony to "take" an endangered species. As used in the Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect an endangered species. Criminal liability under the Act can be imposed for indirect takings resulting from the destruction of an endangered species habitat.

Migratory Bird Treaty Act, 16 U.S.C. 1531—Federal criminal statute which makes it a felony to kill, take or possess migratory birds without a permit.

Bald and Golden Eagle Protection Act, 16 U.S.C. 668.—Federal criminal statute which makes it a misdemeanor to kill, take or possess Bald and Golden Eagles.

Attachment 2

SELF-INSPECTION CHECKLIST

The following are suggestions for building effective BASH self-inspection checklists.

1. Are all BASH related regulations current and readily available?

2. Has a BASH reduction program been implemented?

3. Has a BASH plan been written?

4. Is the BASH plan reviewed annually?

5. Are changes and annual reviews posted to the plan?

6. Does the program establish a Bird Hazard Working Group (BHWG)?

7. Are base agencies such as Safety, CE or EM (Environmental Management) and Ops assigned responsibilities for the BASH program?

8. Is the wing vice commander (or equivalent) the BHWG chairman?

9. Is there an assigned OPR of the BHWG?

10. Does the BHWG meet at least semiannually?

11. Are BASH topics included in flight safety briefings?

12. Are BASH related materials posted in aircrew briefing areas, on safety bulletin boards or base operations flight planning areas?

13. Are local bird problems documented?

14. Are both damaging and nondamaging bird strikes recorded?

15. Are all damaging and nondamaging bird strikes reported to HQ AFSC/SEFW?

16. Are all bird remains collected as a result of a bird strike and sent to HQ AFSC/SEFW?

17. Is the bird strike information tracked to facilitate the identification of trends?

18. Is a bird identification book readily available?

19. Are daily surveys taken of the airfield and surrounding area to observe potential and actual bird hazards?

20. Are records of daily observations kept in order to establish trends?

21. During the surveys, are areas of standing water, food sources or areas birds use for protection noted?

22. Is the vegetation on the airfield particularly attractive to birds?

23. Does the mowing or guideline contract specify the grass be maintained at a height of 7-14 inches?

24. Does the base practice controlled burning?

25. Are trees or shrubs located outside of 1000' of the runways IAW AFR 86-14?

26. Are birds attracted to the taxiways or runways?

27. Have the birds utilizing taxiways and runways been identified?

28. Are birds attracted to areas of water on the airfield?

29. Are the birds feeding in these wet areas?

30. Are the birds attracted to these wet areas identified?

31. Do the wet areas contain vegetation along their perimeters?

32. Do the wet areas contain fish and/or amphibians?

33. Are the wet areas permanent?

34. Are there other areas near the runways that attract birds (horse stables, recreation areas, golf courses, etc...)?

35. Can it be determined what is attracting the birds?

36. Have the birds been identified?

37. Do agricultural practices around the area attract birds?

38. Is the base notified of the plowing times in order to alter operations?

39. Does the base outlease cropland on adjacent areas?

40. Does the lease provide for restrictions concerning BASH?

41. Are landfills or sewage lagoons located near the base?

42. Are these sites covered daily with dirt, wire or netting to discourage birds?

43. Do these sites attract birds?

44. Are other areas near the base attractive to birds (i.e. lakes, ponds, swamps, cemeteries or wildlife areas)?

45. Are game birds and deer controlled so as not to interfere with flying operations?

46. Does the control tower warn operations and pilots of birds in the airdrome?

47. Is there a designated bird dispersal team?

48. What is the average time between upgrade to Bird Watch Condition SEVERE and downgrade back to MODERATE?

49. Is bird harassment equipment on hand and readily available?

50. Are members of the bird dispersal team trained on dispersal techniques?

51. Is a depredation permit on hand and current?

Attachment 3

LOW-LEVEL FLIGHT CONSIDERATIONS

1. Flying routes under the following conditions should be avoided:

a. Areas with known raptor (birds of prey) concentrations during summer, especially during 1000-1700 hours, due to increased thermals. Generally, a maximum altitude of 3,000-4,000' AGL is reached by all raptor species, though soaring can occur at considerably higher altitudes.

b. Areas with ideal terrain for creating thermals during summer months, such as ridge lines, rolling hills and areas near water. This applies to southern Florida and Texas during winter.

2. To reduce potential hazards avoid flying one hour before and after sunrise/sunset when there is a known increase in bird activity and when in the following areas:

a. All coastal areas, Great Lakes region and Great Salt Lake to avoid gulls and shorebirds.

b. Areas of known blackbird and starling roosts. Information is available from the USFWS and local experts.

c. Known local concentrations of waterfowl (ducks, geese, pelicans and swans).

3. Potential bird strike hazards increase at altitudes with most favorable wind speed and direction for migrating birds (particularly near shear altitudes) up to 48 hours prior to and 24 hours after frontal passage; especially October and November. Weather is a prime stimulus for migratory bird movements.

4. Flying near wildlife refuges, landfills, stockyards and food processing plants should be avoided, as these all attract birds.

5. The following may be obtained from HQ AFSC/SEFW, Kirtland AFB to best assess low-level route hazards:

a. Bird Avoidance Model (BAM) graphs for raptor risk predictions.

b. BAM graphs for migratory waterfowl risk predictions.

c. Specific guidance when unusual bird movements are noted.

d. Guidance in specific geographical areas.

6. Consider the following operational changes to reduce threats from bird strikes, mission requirements permitting:

a. Reduce low-level flight time.

b. Reduce formation flying.

c. Reduce airspeed at low-levels.

d. Increase altitudes during low-level flights.

Attachment 4

USDA ANIMAL DAMAGE CONTROL AND US FISH AND WILDLIFE SERVICE OFFICES

To locate the nearest USDA Animal Damage Control specialist or US Fish and Wildlife Service Law Enforcement Officer for assistance with nuisance wildlife or depredation permits, contact the Regional offices listed below:

States included in the USDA Regional Offices are generally divided by the Mississippi River.

USDA Animal Damage Control
Eastern Regional Office
3322 West End Avenue
Suite 301
Nashville, TN 37203
Phone # (615) 736-2007

USDA Animal Damage Control

Western Regional Office

12345 W. Alameda Pkwy

Suite 204

Lakewood, CO 80228

Phone # (303) 969-6560

US Fish and Wildlife Service District Office locations, telephone number and the states included in each district:

District 1, Portland, Oregon; phone # (503) 620-2468; CA, HI, ID, OR, MT and WA

District 2, Albuquerque, New Mexico; phone # (505) 248-7889; AZ, NM, TX and OK

District 3, Snelling, Minnesota; phone # (612) 829-7874; IA, IN, IL, OH, MN, MO, MI and WI

District 4, Atlanta, Georgia; phone # (404) 978-7168; AL, FL, MS, AR, TN, KY, NC, SC, LA, GA and Puerto

Rico

District 5, Hadley, Massachusetts; phone # (413) 533-6945; MA, CT, NH, VT, MD, WV, PA, VA, NJ, NY and

ME

District 6, Denver, Colorado; phone # (303) 674-1653; ND, CO, WY, MT, UT, KS, SD and NE

District 7, Anchorage, Alaska; phone # (907) 345-0063; AK

Attachment 5

AUTHORIZED EQUIPMENT LIST

NOMENCLATURE	NATIONAL STOCK NUMBER	PART NUMBER
Binoculars, prisim type	6650-01-108	PN 6702513
Shotgun, single barrel, 12 guage	1005-01-073-2368	PN Model 162
Shotgun, pump, 12 guage	1005-00-973	PN Model 870
Shotgun, automatic, 12 guage*	1005-00-934	PN Model 1100-12
Pistol, pyrotechnic, (Very)	1095-00-726-5657	PN 7265657
Scare Cartridges, 12 guage	1370-01-204-1525	NONE
Cassette Tape Recorder	5835-01-053-3152	PN Model AP 30
Speaker, High Power	5965-01-053-6210	PN Model AP 30
Gas Exploding Cannon	3740-00-076-3541	BB 101

NOTE:

*Do not use automatic shotguns to launch scare cartridges because they will jam the action.

NOTE:

Due to frequent changes in wildlife control products, consult with your MAJCOM/SEF or HQ AFSC/ SEFW for up to date equipment authorization information.